

Produced Capital in Ethiopia, Indonesia, and Trinidad and Tobago

Trends and policy implications

Livia Bizikova, Robert Smith, Zakaria Zoundi
April 2024

Key Messages

- Despite steady growth since 1995, produced capital levels in Ethiopia, Indonesia, and Trinidad and Tobago remain low in comparison to developed countries and highly concentrated in just a few sectors, creating barriers to innovation, sustainability, and the expansion of human capital.
- These countries will require additional investments in renewable energy and agriculture to achieve their climate and food security ambitions.
- Because produced capital—and wealth in general—is not regularly measured by statistical offices in these countries, policy-makers are generally blind to these challenges, making it harder for them to generate well-being for their citizens and achieve the Sustainable Development Goals.

For more than half a century, GDP has been accepted as the most relevant measure of a country's economic success. GDP is defined as the aggregate measure of income in an economy during a given time period. However, it is often used, inappropriately, as a proxy measurement for well-being more broadly. A recent policy brief published by the UN Secretary-General invites member states to move beyond GDP by measuring what truly matters for sustainability and prosperity (United Nations, 2023). It demonstrates just how damaging it can be to rely on GDP as a broad measure of progress. This note outlines the shortcomings of GDP as an indicator of progress. It suggests more meaningful measures that meet the UN Secretary-General's criteria for robust metrics that can move the world beyond GDP: concise, widely accepted, comparable, iterative and dynamic, country-owned, scientifically robust, statistically sound, and applicable to decision making (United Nations, 2023).



Box 1. Comprehensive/inclusive wealth measures five types of assets:

- **Produced capital** consists of roads, railways, ports, houses, machinery, and other manufactured assets.
- **Natural capital** includes market-oriented natural resources such as timber, minerals, oil, and gas. It also includes the non-market economic value of ecosystems, such as wetlands, and forests.
- **Human capital** comprises the collective knowledge, skills, and capabilities of the labour force—the result of lifelong learning in both formal and informal settings.
- **Financial capital** includes bank deposits, stocks, bonds, and other forms of financial assets.
- **Social capital** represents the norms and behaviours that structure and support productive interactions between members of society, including safety, inclusivity, and trust in institutions.

Sources: *International Institute for Sustainable Development (IISD), 2018; World Bank, 2021.*

While gains in GDP are, under certain conditions, linked to improved human well-being, there are well-documented negative impacts on well-being associated with GDP growth. These negative impacts can include the depletion of natural resources, increasing greenhouse gas emissions, and a growing divide between the rich and poor. In addition, GDP figures do not capture the value of important long-term investments in human well-being, such as education and health care, or the value of many measures to address climate change. There is a growing body of applied research to identify indicators intended to address the shortcomings of GDP as a measure of well-being. Such indicators are intended to better reflect our understanding of prosperity. Among the various indicators, comprehensive or inclusive wealth (C/IW) is seen as a methodologically sound measurement that complements GDP and meets the criteria of the new measures laid out by the UN Secretary-General (United Nations, 2023). C/IW is a valuable instrument for policy-makers to use to move beyond GDP and better reflect the foundations of prosperity and well-being in their decisions.

Partial findings of the project on Measuring Comprehensive Wealth to Promote Sustainable Development¹ carried out by IISD are summarized below. This project developed C/IW estimates for Ethiopia, Indonesia, and Trinidad and Tobago and identified their relevance to policy making. The findings reported here focus only on produced capital (see Box 1 for a description of all five elements of the C/IW portfolio). Additional notes in this series focus on the results relating to other elements of the C/IW portfolio.

¹ See more on the project here: <https://www.iisd.org/projects/measuring-wealth-promote-sustainable-development>



What Is Produced Capital?

Produced capital represents the value of the stock of all human-made assets used to produce goods and services in the economy.² The major characteristic of produced capital is that it is used repeatedly in production systems. Produced capital is not necessarily physical in nature. It also includes intangible assets such as intellectual property. The measurement of produced capital stocks is well established (Organisation for Economic Co-operation and Development, 2009), and statistical offices in many countries publish data on it, though not all countries do. For this project, it was necessary to prepare estimates of the capital stocks produced for the three countries studied, as such data were not available from their national statistical offices.³

Trends for Produced Capital

At the global level, produced capital represents just below a third of global wealth (World Bank, 2021), making it the next most important after human capital.⁴ In all three countries studied in this project, the stock of produced capital grew over the 25 years studied. We measured the value of produced capital stocks in both the local currencies (in real/inflation-adjusted terms) and in United States dollars (USD)⁵ for comparison.

In Indonesia, the annual average growth in aggregate real produced capital was 6.8% in IDR from 1995 to 2020. Indonesia's population grew by 1.7% annually over the same period, so real produced capital per capita grew at an average of 5.4% annually (Figure 1). The value increased from IDR 54.5 million (USD 11,603) to IDR 203.7 million (USD 43,379) per capita. In Ethiopia, real produced capital grew at an average rate of 3.6% over the period, from ETB 13,751 (USD 1,614) to ETB 30,331 (USD 3,560) per capita (Figure 2). Trinidad and Tobago experienced the lowest annual growth among the three countries (2.5%), with real produced capital increasing from TTD 124,937 (USD 30,015) in 1995 to TTD 229,247 (USD 55,075) per capita (Figure 3).

The impacts of various global and national events are clear in the charts below. Growth in produced capital was slow in Indonesia following the Asian financial crisis of 1997 (Aghevli, 1999) but began growing in the mid-2000s as a result of the global commodities boom (Adler, 2012). In Ethiopia, the prolonged impact of internal conflicts is apparent in the stagnation of produced capital up to 2010/2011.⁶ Following the resolution of these conflicts, investment

² The United Nations System of National Accounts defines produced capital as “produced assets that are used repeatedly or continuously in production processes for more than one year” (European Commission et al., 2009, para. 10.11).

³ The statistical offices in Ethiopia and Trinidad and Tobago do not measure produced capital stocks. The statistical office in Indonesia does measure them but its time series begins in 2016, whereas the study period here stretches back to 1995.

⁴ Human capital represents more than half of wealth in all countries (World Bank, 2021).

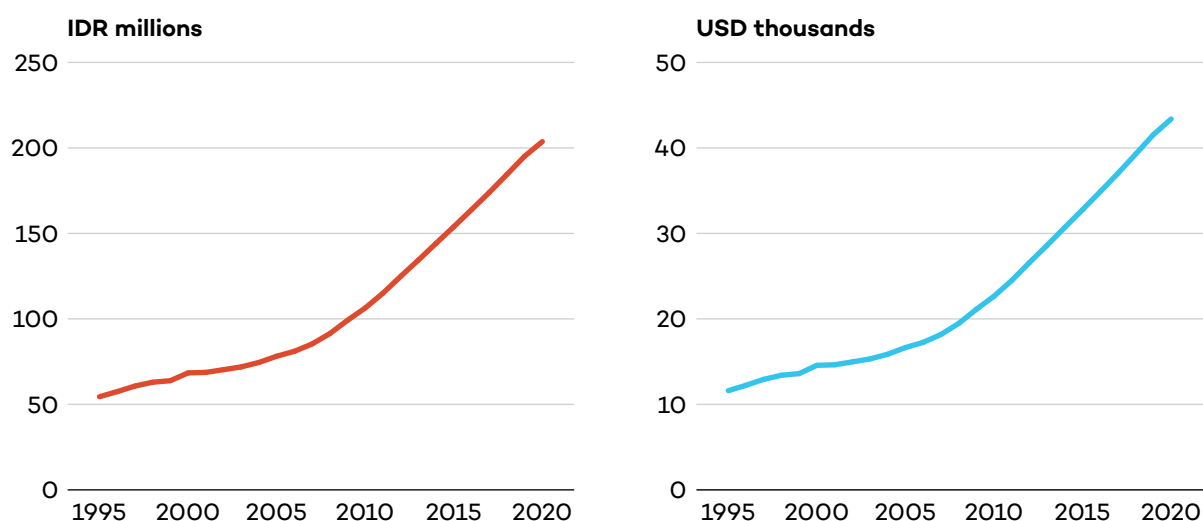
⁵ All values in constant local currency use 2017 as the base year (and 2016/2017 as the base for Ethiopia). All values in constant USD also use 2017 as the base year and the 2017 purchasing power parity (PPP) conversion rate from local currency to USD as reported by the World Bank (n.d.). The application of the 2017 PPP conversion rate to the entire time series results in identical growth trends over time, regardless of whether the results are presented in constant local currency or constant USD.

⁶ Note that Ethiopia uses a fiscal year rather than the calendar year to report its statistics.



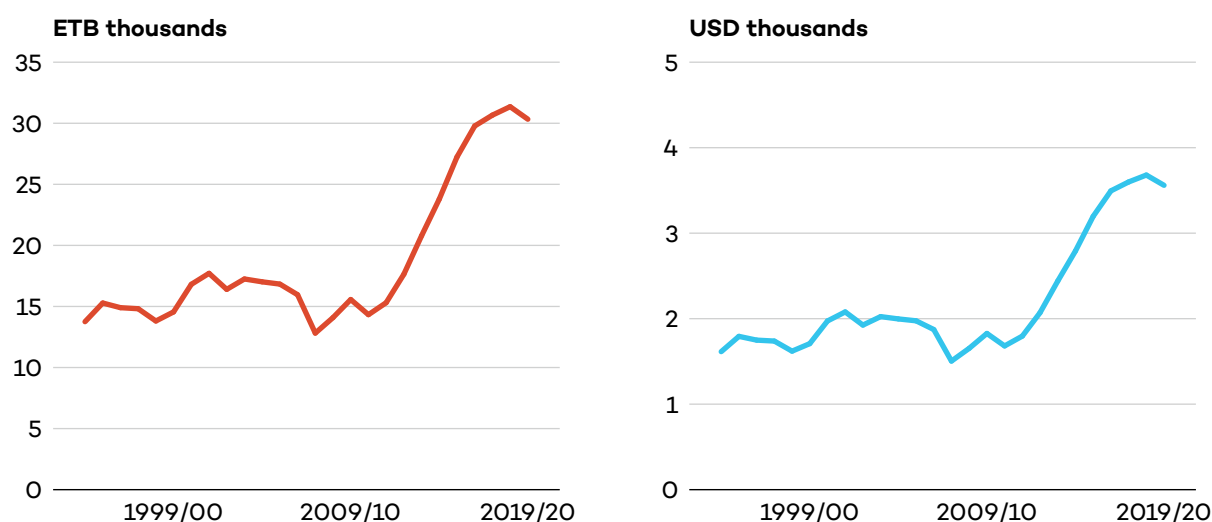
in produced capital grew quickly until the beginning of the more recent period of conflict. Ethiopia remains far below Indonesia and Trinidad and Tobago, with the average Ethiopian having access to less than a 10th of the produced capital available to people in Indonesia and Trinidad and Tobago. Trinidad and Tobago, for its part, managed to rapidly increase its produced capital per capita up to the mid-2000s. Following the global economic crisis of 2008, the country actually declined in terms of produced capital per capita thanks to the slow recovery of oil and gas demand during those years. Growth in produced capital per capita picked up again after 2012, though at a much slower rate than previous to that.

Figure 1. Indonesia: Produced capital per capita at 2017 prices



Source: Authors' calculation based on data supplied by BPS-Statistics Indonesia and the World Bank.

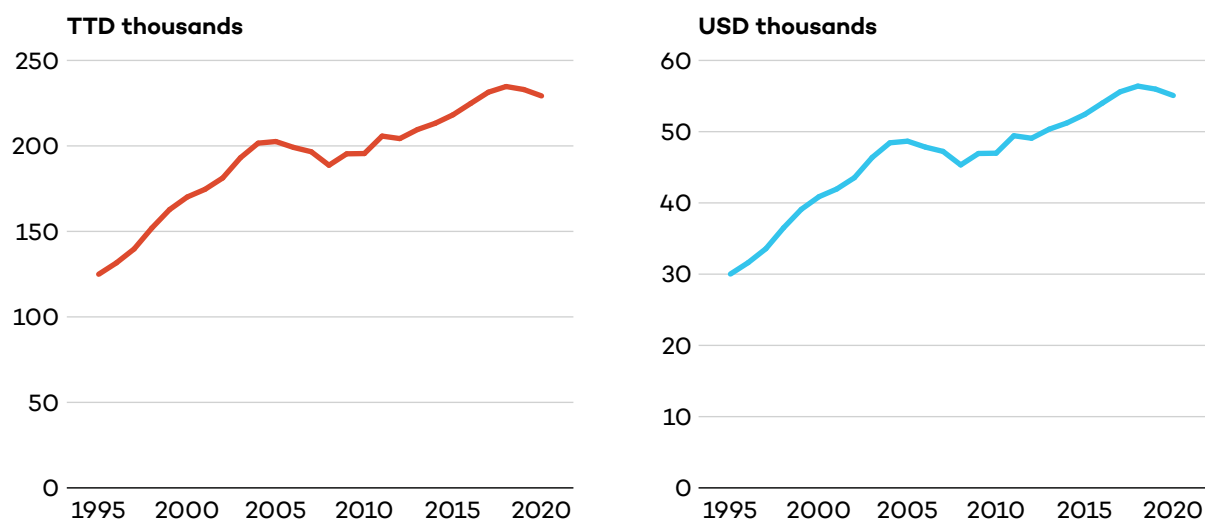
Figure 2. Ethiopia: Produced capital per capita at 2017 prices



Source: Author's calculations based on data supplied by Economy Watch, the Central Statistical Authority, the National Bank of Ethiopia, and the World Bank.

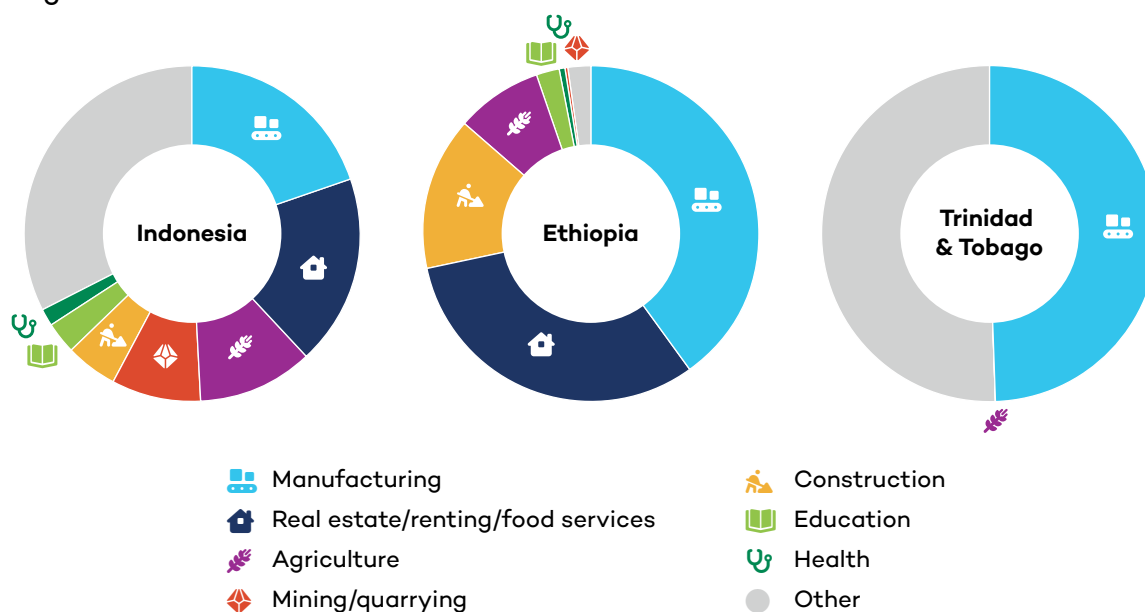


Figure 3. Trinidad and Tobago: Produced capital per capita at 2017 prices



Source: Authors' calculations based on data supplied by the Central Bank of Trinidad and Tobago, Central Statistical Office, National Archive, UN Statistics Division, and World Bank.

Figure 4. Distribution of produced capital in Indonesia, Ethiopia, and Trinidad and Tobago in 2020



Source: Authors' calculations based on data from national and international sources. Indonesia: BPS-Statistics Indonesia and the World Bank; Ethiopia: Economy Watch, the Central Statistical Authority, the National Bank of Ethiopia and the World Bank; Trinidad and Tobago: the Central Statistical Office, National Archive, UN Statistics Division, and the World Bank.

Note: For Indonesia, data refer to 2018, the latest year for which the breakdown by sector is available. No breakdowns other than petroleum and "other" are available for Trinidad and Tobago. The figure of 49.5% for Trinidad and Tobago reflects just the contribution of the petroleum industry to the mining and quarrying industry. Petroleum production dominates this industry in Trinidad, however, so the total share for the mining and quarrying industry would not be much greater than this.



In all three countries, our results show a concentration of produced capital in just a few industries with limited economic diversification (Figure 4). In Ethiopia and Indonesia, the stock of produced capital is highly concentrated in two sectors of the economy: manufacturing and real estate (Figure 4). In Trinidad and Tobago, it is highly concentrated in just one industry, petroleum production, which is the major driver of the country's economy and accounts for 50% of its produced capital.

Policy Implications

Measuring changes in produced capital and its components can provide important messages about a country's development pathway. In relation to government policies, produced capital stocks and their sectoral distribution illuminate the success—or lack thereof—of economic diversification efforts and climate policies designed to shift investment away from sectors with significant carbon footprints, such as oil and gas. The figures can also help inform broader discussions about societal well-being. While the growing value of produced capital in the three countries can be seen as a positive trend, not all trends are positive. In particular, the following observations can be noted:

- **Overall, there are low levels of produced capital** in all three countries. On a real per capita basis in USD, the average citizen of Ethiopia, Indonesia, and Trinidad and Tobago laid claim to USD 3,600, USD 43,000, and USD 55,000 of produced capital, respectively, in 2020. By way of comparison, the average Canadian benefited from USD 145,000 of produced capital in that year. With far more produced capital to employ in generating well-being than those in Indonesia, Trinidad and Tobago, and Ethiopia, Canadians are better placed to face the challenges of a changing world. Canada has its own problem with diversification, however, with far too much of its produced capital invested in oil and gas extraction and residential housing (International Institute for Sustainable Development, 2018).
- **There is an uneven allocation of investments in produced capital**, especially in Trinidad and Tobago, where there is a strong concentration of produced capital in the oil and gas extraction industry. Fully 50% of Trinidad and Tobago's produced capital was devoted to this industry in 2020. This can create economic challenges, including the possibility of “stranding” this capital, given the volatility of oil and gas prices and exchange rates, declining reserves, and the shift away from fossil fuels to address climate change. Excessive concentration of investment like this can limit efforts to promote innovation, efficiency, sustainable job creation, and the development of the human capital needed for the future.
- **There is limited evidence of renewable energy investment** in Indonesia and Trinidad and Tobago. There is a growing need everywhere to address climate change through mitigation and adaptation investments. In most countries, emissions reductions are expected from the energy sectors based on their (intended) nationally



determined contributions.⁷ While Ethiopia has made major investments in new hydroelectricity dams, Indonesia and Trinidad and Tobago both remain highly dependent on fossil fuels for electricity production. According to the International Renewable Energy Agency (2024), these countries generated 82% and nearly 100% of their electricity using fossil fuels in 2020, respectively. This practice will constrain their ability to meet their climate change commitments.

- **There is limited investment in agri-food systems and agricultural productivity** in all three countries, but especially in Ethiopia, where the agriculture industry remains a major contributor to GDP. The agriculture industry contributes more than 40% of Ethiopia's GDP on average, but only 8% of the country's produced capital was devoted to that industry. In contrast, 40% of produced capital is dedicated to manufacturing, though that industry contributes only about 8% of Ethiopia's GDP. This suggests that Ethiopia's investment policies are not oriented to provide the greatest opportunities to improve people's lives and advance the nation's development. Agri-food systems contribute significantly to GDP and especially to rural livelihoods in all lower-income countries. These systems face various challenges, including low yield and limited access to inputs and mechanization, as well as failing market access and weak value chains. Produced capital can make significant contributions to achieving sustainable agri-food systems. At the recent UN Food System Summit,⁸ many countries identified the need to increase investment to improve the productivity of agriculture and increase access to affordable, nutritious foods.
- **Data and methodological challenges** were observed in all three countries and can be anticipated in other countries as well. That said, none of the challenges was insurmountable. Key challenges included the availability of sectoral data on fixed capital formation, limited data on inventories, gaps in the available series that resulted in data interpolation and extrapolation, insufficient data on fixed capital formation by types of assets (machinery, equipment, transport etc.), and a lack of accurate estimations of asset depreciation rates for each country, which is important from a resilience and sustainability standpoint.

⁷ See the countries' nationally determined contributions here: Ethiopia: https://unfccc.int/sites/default/files/NDC/2022-06/Ethiopia%27s%20updated%20NDC%20JULY%202021%20Submission_.pdf; Indonesia: <https://unfccc.int/sites/default/files/NDC/2022-09/ENDC%20Indonesia.pdf>; Trinidad and Tobago: <https://unfccc.int/sites/default/files/NDC/2022-06/Trinidad%20and%20Tobago%20Final%20INDC.pdf>

⁸ Links to all country documents submitted to the summit are available here: <https://www.un.org/en/food-systems-summit/documentation>



References

- Adler, G. (2012, January 19). Volatility in external demand: Indonesia's commodity boom and overall competitiveness. In T. Rumbaugh (Ed.), *Indonesia: Sustaining growth during volatility* (ch. 4). International Monetary Fund. <https://www.elibrary.imf.org/display/book/9781616352028/ch004.xml>
- Aghevli, B. B. (1999). The Asian crisis: Causes and remedies. *Finance & Development*, 36(2). <https://www.imf.org/external/pubs/ft/fandd/1999/06/aghevli.htm>
- European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, & World Bank. (2009). *System of National Accounts 2008*. <https://unstats.un.org/unsd/nationalaccount/docs/sna2008.pdf>
- International Institute for Sustainable Development. (2018). *Comprehensive wealth in Canada: Measuring what matters in the long term*. <https://www.iisd.org/system/files/publications/comprehensive-wealth-canada-2018.pdf>
- International Renewable Energy Agency. (2024). Electricity generation (GhW) by country/area, technology, grid connection, and year. IRENASTAT Online Data Query Tool. https://pxweb.irena.org/pxweb/en/IRENASTAT/IRENASTAT_Power%20Capacity%20and%20Generation/ELECGEN_2023_cycle2.px/
- Organization for Economic Co-operation and Development. (2009). *Measuring capital: OECD manual*. <https://www.oecd.org/sdd/productivity-stats/43734711.pdf>
- United Nations. (2023, May). *Valuing what counts: Framework to progress beyond Gross Domestic Product* (Our Common Agenda Policy brief 4). <https://www.un.org/sites/un2.un.org/files/our-common-agenda-policy-brief-beyond-gross-domestic-product-en.pdf>
- World Bank. (2021). *The changing wealth of nations 2021: Managing assets for the future*. <https://openknowledge.worldbank.org/entities/publication/e1399ed3-ebe2-51fb-b2bc-b18a7f1aaaed>
- World Bank. (n.d.). PPP conversion factor (LCU per international \$). International Comparison Program, World Development Indicators Database, and EUROSTAT-OECD PPP Programme. <https://data.worldbank.org/indicator/PA.NUS.PPP>

This report was prepared under the direction of the International Institute for Sustainable Development. The authors are grateful to the International Development Research Centre for their financial support for this project. The project benefitted immensely from the collaboration of three partner universities. At Mekelle University, Ethiopia, the project was led by Dr Mesfin Tilahun from the Department of Economics. At the University of the West Indies, St. Augustine, Trinidad and Tobago, the project was run under the leadership of Dr Godfrey St. Bernard from the Sir Arthur Lewis Institute of Social and Economic Studies. In Indonesia, the project was led by Dr Alin Halimatussadiyah from the SDG Hub at the Institute for Economic and Social Research – Faculty of Economics and Business Universitas Indonesia.

© 2024 The International Institute for Sustainable Development
Published by the International Institute for Sustainable Development

This publication is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-nc-sa/4.0/).

INTERNATIONAL INSTITUTE FOR SUSTAINABLE DEVELOPMENT

The International Institute for Sustainable Development (IISD) is an award-winning independent think tank working to accelerate solutions for a stable climate, sustainable resource management, and fair economies. Our work inspires better decisions and sparks meaningful action to help people and the planet thrive. We shine a light on what can be achieved when governments, businesses, non-profits, and communities come together. IISD's staff of more than 200 experts come from across the globe and from many disciplines. With offices in Winnipeg, Geneva, Ottawa, and Toronto, our work affects lives in nearly 100 countries.

IISD is a registered charitable organization in Canada and has 501(c)(3) status in the United States. IISD receives core operating support from the Province of Manitoba and project funding from governments inside and outside Canada, United Nations agencies, foundations, the private sector, and individuals.

Head Office

111 Lombard Avenue, Suite 325
Winnipeg, Manitoba
Canada R3B 0T4

Tel: +1 (204) 958-7700
Website: iisd.org
X: @IISD_news

